

What is claimed is:

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1 1. A method for fabricating a SnO₂ gate ISFET

2 device, comprising steps of:

3 providing a semiconductor substrate;

4 forming a virtual gate on the semiconductor

5 substrate to define the gate area of the ISFET;

6 forming a source/drain in the semiconductor

7 substrate beside the virtual gate;

8 removing the virtual gate;

9 forming a SnO₂ gate in the gate area to form an

10 ISFET.

1 2. The method as claimed in claim 1, wherein

2 forming the virtual gate to define the gate area of the

3 ISFET further comprises:

4 rinsing the semiconductor substrate;

5 forming a pad oxide layer on the semiconductor

6 substrate; and

7 removing a portion of the oxide layer to form a
8 virtual gate to define the gate area.

1 3. The method as claimed in claim 2, wherein
2 forming the SnO₂ gate in the gate area comprises:

3 coating a solution comprising SnCl₂•2H₂O and ethanol
4 on the surface of the gate oxide layer of the ISFET; and

5 heating the semiconductor substrate to a
6 predetermined temperature for a predetermined time
7 interval.

1 4. The method as claimed in claim 1, wherein
2 forming the source/drain beside the virtual gate further
3 comprises doping the semiconductor substrate by the
4 virtual gate as a mask to form a source/drain.

1 5. The method as claimed in claim 3, wherein the
2 concentration of the solution comprising SnCl₂•2H₂O and
3 ethanol is 0.37M.

1 6. The method as claimed in claim 3, wherein the
2 predetermined temperature ranges from 350°C to 400°C.

1 7. The method as claimed in claim 3, wherein the
2 predetermined interval is one hour.

1 8. The method as claimed in claim 1, wherein the
2 thickness of the SnO₂ gate is at least 1000Å.